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EXAMINER	
BELLO, AGUSTIN	
ART UNIT	**PAPER NUMBER**
2633	12

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/651,140	JIANG ET AL.	
	Examiner	Art Unit	
	Agustin Bello	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-36 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-36 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,6,1011 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 22 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 22 recites the limitation "the sliding arm" in line 8. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 2, 9, 11-20, and 23-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (U.S. Patent No. 5,337,396) in view of Yingst (U.S. Patent No. 5,117,476).

Regarding claims 1, 19, and 29, Chen teaches a fiber optic module for transmitting and/or receiving data, the fiber optic module comprising: a printed circuit board (reference numeral 21 in Figure 4), the printed circuit board having high frequency electrical components (reference numerals 20a, 20b in Figure 4) mounted to a first surface and a first ground plane (reference numeral 27 in Figure 4) formed on the first surface near a first edge; a fiber optic receptacle (reference numeral 15 in Figure 3), the fiber optic receptacle coupled to the printed circuit board

(as seen in Figure 5). Chen differs from the claimed invention in that Chen fails to specifically teach a plurality of parallel fiber optical receptacles coupled to the printed circuit board and an electromagnetic interference shield, the electro magnetic interference shield coupled to the ground plane of the printed circuit board such that it covers the high frequency electrical components mounted to the surface and forms a first guide rail near the first edge. However, Yingst, in the same field of endeavor, teaches it is well known in the art to have a plurality of fiber optical receptacles coupled to a printed circuit board in parallel (as seen in Figures 4 and 5) and to use an electromagnetic interference shield (reference numeral 130 in Figure 2) coupled to the ground plane of the printed circuit board such that it covers the high frequency electrical components mounted to the surface of the printed circuit board. The teachings of Yingst would have suggested to one skilled in the art that it would have been possible to cover the high frequency electrical components mounted to the surface of a printed circuit board and thereby form a first guide rail near the first edge (as seen in Figure 4). One skilled in the art would have been motivated to incorporate the teachings of Yingst into the system of Chen in order to allow transmission and reception of optical signals via a plurality of parallel fiber optical receptacles and to electromagnetically shield the rest of the system form interference from the high frequency electrical components. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate a plurality of parallel fiber optical receptacles coupled to the printed circuit board and an electromagnetic interference shield coupled to the ground plane of the printed circuit board such that it covers the high frequency electrical components mounted to the surface and forms a first guide rail near the first edge.

Regarding claims 2 and 30, the combination of Chen and Yingst teaches that the first guide rail (formed as discussed above) is formed to slideably couple to a first guide rail slot (reference numeral 11e in Figure 1 of Chen) of a module cage (reference numeral 11 in Figure 1 of Chen).

Regarding claim 9, the combination of Chen and Yingst teaches that the electromagnetic interference shield (reference numeral 126 in Figure 2 of Yingst) couples to the ground plane of the printed circuit board such that it covers the high frequency electrical components mounted to the first surface and forms a second guide rail near a second edge of the printed circuit board (as seen in Figure 4).

Regarding claims 11 and 26, the combination of Chen and Yingst differs from the claimed invention in that it fails to specifically teach a processor to control the transmitting/receiving of data through at least one of the plurality of fiber optic receptacles. However, the combination of references does teach a plurality of electronic circuits mounted on the surface of the printed circuit board thereby suggesting a processor to control the transmitting/receiving of data through at least one of the plurality of fiber optic receptacles since the fiber optical receptacles are also coupled to the printed circuit board, the fiber optical receptacles receiving and transmitting signals from the electronic circuits. One skilled in the art would have been motivated to have included a processor to control the transmitting/receiving of data through at least one of the plurality of fiber optic receptacles in order to control the flow on information to and from the module. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to use a processor to control the transmitting/receiving of

data through at least one of the plurality of fiber optic receptacles in the system of the combination of references.

Regarding claim 12, the combination of Chen and Yingst teaches a plurality of fiber optic receptacles; and, the printed circuit board having a hot-pluggable connector (reference numeral 20c in Figure 1 of Chen, reference numeral 122, 100 in Figure 5 of Yingst) to couple an electrical signal between the printed circuit board and an electrical device (reference numeral 26 in Figure 1 of Yingst) located off of the printed circuit board. The combination of references differs from the claimed invention in that it fails to specifically teach four fiber optic receptacles. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use four fiber optical receptacles, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co., 193 USPQ 8.*

Regarding claims 13, 14, and 28, the combination of Chen and Yingst differs from the claimed invention in that it fails to specifically teach the use of LC, MT, or RJ connectors. However, LC, MT, and RJ connector types are very well known in the art and readily available. One skilled in the art would have been motivated to use LC, MT, or RJ connectors in order to make the system compatible with many of the communication system in use today. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to use LC, MT, or RJ connectors in the system of the combination of references.

Regarding claim 15, Chen and Yingst teach that the printed circuit board has an electrical component (reference numeral 190, 191 in Figure 2 of Yingst and reference numeral 16 in Figure 3 of Chen) to convert signals between an electrical form and an optical form.

Regarding claim 16, the combination of Chen and Yingst teaches that the printed circuit board has surface mount electrical components (column 2 lines 50-53 of Chen).

Regarding claim 17, the combination of Chen and Yingst teaches that the printed circuit board has through-hole electrical components (column 2 lines 53-59 of Chen).

Regarding claim 18, the combination of Chen and Yingst teaches that said printed circuit board includes pins (reference numeral 20c in Figure 4 of Chen, reference numeral 122 in Figure 5 of Yingst) outside of said electromagnetic interference shield, said pins being adapted to being soldered to a printed circuit board external to said fiber optic module (column 4 lines 6-9, 64-65 of Yingst).

Regarding claim 20, the combination of Chen and Yingst teaches a host printed circuit board (reference numeral 24 in Figure 1 of Yingst) to couple to the module cage (reference numeral 11 in Figure 1 of Chen and reference numeral 22 in Figure 1 of Yingst) and the fiber optic module (reference numeral 20 in Figure 1 of Chen and as seen in Figure 2 of Yingst), the host printed circuit board including a ground plane (column 4 lines 66-68, column 5 lines 1-17 of Yingst) to electrically couple (via elements 50 in Figure 2 and element 100 in Figure 3 of Yingst) to the one or more guide rail slots (reference numeral 11e in Figure 1 of Chen and reference numeral 40 in Figure 2 of Yingst) of the module cage, and one or more connectors (inherent connection via elements 48, 50 in Figure 2 and element 100 in Figure 3 of Yingst) to couple to the one or more electrical connectors of the fiber optic module and their respective pins (reference numeral 20c in Figure 1 of Chen and reference numeral 122 in Figure 2 of Yingst).

Regarding claim 23, the combination of Chen and Yingst teaches that the module cage further has one or more tabs (reference numeral 48, 50 in Figure 1 and reference numeral 100 in

Figure 3 of Yingst) to electrically couple the one or more guide slots to the ground plane of the host chassis ground (column 4 lines 66-68, column 5 lines 1-17 of Yingst).

Regarding claim 24, the combination of Chen and Yingst differs from the claimed invention in that it fails to specifically teach that each of the one or more guide slots of the module cage has a flared opening to more easily accept the one or more guide rails of the fiber optic module. However, one skilled in the art would have been motivated to flare the openings of the one or more guide slots of module cage in order to allow one skilled in the art to easily insert the guide rails of the fiber optical module into the module cage without having to match the rail precisely with the slot. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to flare the openings of the one or more guide slots of module cage.

Regarding claim 25, the combination of Chen and Yingst teaches the module cage is formed of a conductive material to provide another electromagnetic shield (column 3 lines 19-21 of Chen).

Regarding claim 27, the combination of Chen and Yingst differs from the claimed invention in that it fails to specifically teach that said fiber optic module and said module cage is a GBIC package. However, Gigabit Interface Card Packages are very well known in the art. One skilled in the art would have been motivated to form the module and module cage in the form of a GBIC in order to allow the module to communication over a network. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to form the module in the form of a GBIC package.

6. Claims 3-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen in view of Yingst and Arvanitakis (U.S. Patent No. 5,005,939).

Regarding claim 3, the combination of Chen and Yingst teaches an optical block (reference numeral 11a in Figure 1 of Chen and reference numeral 36 in Figure 2 of Yingst), but differs from the claimed invention in that it fails to specifically teach that the optical block has a plurality of lenses, each of the plurality of lenses for coupling photons between a plurality of fiber optic cables coupled to the plurality of fiber optic receptacle receptacles and the fiber optic module. However, the use of lenses in optical communication systems is very well known in the art. Furthermore, Arvanitakis, in the same field of endeavor, teaches it is well known in the art to use lenses (column 5 lines 39-42) within an optical block (formed by (reference numerals 23, 25, and 35 in Figure 1) for coupling photons between a plurality of fiber optic cables coupled to the plurality of fiber optic receptacle receptacles and the fiber optic module. One skilled in the art would have been motivated to use such a configuration in order to efficiently couple light to an from the fiber optical module. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to use an optical block having a plurality of lenses, each of the plurality of lenses for coupling photons between a plurality of fiber optic cables coupled to the plurality of fiber optic receptacle receptacles and the fiber optic module.

Regarding claim 4, the combination of references teaches that the optical block has a plurality of optical ports (reference numeral 15b in Figure 1 of Chen, reference numerals 70, 71 in Figure 2 of Yingst, and reference numeral 41 in Figure 1 of Arvanitakis) each having a fiber ferule inserted therein for aligning the fiber optic cables to the plurality of lenses of the optical block.

Regarding claim 5, the combination of references teaches that the optical block has a plurality of openings, each of the plurality of openings facing each of the respective plurality of lenses on a second side (being that there are opening on both side of the blocks), each of the plurality of openings having sufficient size to accept a transmitter or a receiver (reference numeral 38 in Figure 2 of Yingst and back of reference numerals 31, 33 of Arvanitakis).

Regarding claim 6, the combination of references teaches a plurality of transmitters coupled into the plurality of openings in the optical block (reference numeral 190, 191 in Figure 2 of Yingst, reference numeral 31, 33 in Figure 1 of Arvanitakis, reference numeral 16 in Figure 3 of Chen), but differs from the claimed invention in that it fails to specifically teach that each of the plurality of transmitters including a vertical cavity surface emitting laser. However, vertical cavity surface emitting lasers are well known in the art and readily available. One skilled in the art would have been motivated to use vertical cavity surface emitting lasers in order to reduce the overall size of the system. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to use vertical cavity surface emitting lasers in the system of the combination of references.

Regarding claim 7, the combination of references teaches a plurality of receivers coupled into the plurality of openings in the optical block (reference numeral 190, 191 in Figure 2 of Yingst, reference numeral 31, 33 in Figure 1 of Arvanitakis, reference numeral 16 in Figure 3 of Chen), each of the plurality of receivers including a photodiode (column 4 lines 55-57 of Chen), and an amplifier (column 5 lines 57-60 of Arvanitakis). The combination of references differs from the claimed invention in that it fails to specifically teach that the amplifier is a trans-impedance amplifier. However, trans-impedance amplifiers are very well known in the art and

readily available. One skilled in the art would have been motivated to use a transmission-impedance amplifier in order to improve the ratio of differential output voltage to differential control current. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to use a transmission-impedance amplifier.

Regarding claim 8, the combination of references differs from the claimed invention in that it fails to specifically teach a plurality of transmitters and receivers coupled into the plurality of openings in the optical block, each of the plurality of transmitters including a vertical cavity surface emitting laser and receivers including a photodiode. However, as discussed above vertical cavity surface emitting lasers are well known in the art and Chen teaches photodiodes. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include a plurality of transmitters and receivers coupled into the plurality of openings in the optical block since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co., 193 USPQ 8.*

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen in view of Yingst and Mostov (U.S. Patent No. 6,175,727).

Regarding claim 10, the combination of Chen and Yingst teaches that the first and second guide rail extend outside the electromagnetic interference shield on opposites sides of the fiber optic module (as seen in Figure 4 of Yingst), but differs from the claimed invention in that it fails to specifically teach that the electromagnetic interference shield sandwiches the printed circuit board. However, Mostov, in the same field of endeavor, teaches it is well known in the art to sandwich a printed circuit board with an electromagnetic shield (column 6 lines 41-51 and Figure

2). One skilled in the art would have been motivated to sandwich a printed circuit board with an electromagnetic shield in order to shield both sides of the printed circuit board from EMI. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to sandwich a printed circuit board with an electromagnetic shield.

8. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen in view of Yingst and Kocher (U.S. Patent No. 4,178,051).

Regarding claim 21, the combination of Chen and Yingst differs from the claimed invention in that it fails to specifically teach a lock mechanism, the lock mechanism having a rocker arm with a hook to couple to a guide rail of the fiber optic module to lock it in place, and a cam to couple to a cutout of a sliding arm and decouple the hook of the rocker arm from the guide rail of the fiber optic module. However, lock mechanisms of this type are well known in the art. Kocher teaches a lock mechanism (Figure 4), the lock mechanism having a rocker arm (reference numeral 50 in Figure 4) with a hook (reference numeral 52 in Figure 4) to couple to a guide rail of the fiber optic module (reference numeral 46 in Figure 4) to lock it in place, and a cam (reference numeral 56 in Figure 4) to couple to a cutout of a sliding arm (reference numeral 58 in Figure 4) and decouple the hook of the rocker arm from the guide rail of the fiber optic module. One skilled in the art would have been motivated to use a locking mechanism as taught by Kocher in the device of the combination of Chen and Yingst in order to secure the fiber optical module in proper alignment with the inserted fibers. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to use a locking mechanism as taught by Kocher in the device of the combination of Chen and Yingst.

9. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen in view of Yingst and Jelinek (U.S. Patent No. 6,581,830).

Regarding claim 22, the combination of Chen and Yingst differs from the claimed invention in that it fails to specifically teach an ejection mechanism, the ejection mechanism having a lever arm with a cradle at a pivoting end, the cradle to couple to an end of the printed circuit board of the fiber optic module to push out and eject the fiber optic module, an opposite end of the lever arm coupled to the sliding arm to cause the lever arm to pivot about the pivoting end and eject the fiber optic module when the sliding arm is pushed in by a user to unlock and eject the fiber optic module. However, Jelinek teaches an ejection mechanism (Figure 8), the ejection mechanism having a lever arm (reference numeral 86 in Figure 8) with a cradle (reference numeral 80 in Figure 8) at a pivoting end, the cradle to couple to an end of the printed circuit board (reference numeral 87 in Figure 8) of the fiber optic module to push out and eject the fiber optic module, an opposite end of the lever arm coupled to the sliding arm (reference numeral 81 in Figure 8) to cause the lever arm to pivot about the pivoting end (reference numeral 83 in Figure 8) and eject the fiber optic module when the sliding arm is pushed in by a user to unlock and eject the fiber optic module. One skilled in the art would have been motivated to use an ejection mechanism as taught by Jelinek in the device of the combination of Chen and Yingst in order to easily eject the printed circuit board of the module when desired. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to use an ejection mechanism as taught by Jelinek in the device of the combination of Chen and Yingst.

10. Claims 31-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yingst.

Regarding claims 31 and 34, Yingst teaches a fiber optic system for transmitting and/or receiving data, comprising: a fiber optic module (Figure 1) having channels (reference numeral 190, 191 in Figure 2) for parallel optical transmitting and/or receiving of data; a module cage (reference numeral 28 in Figure 2); optical receptacles (reference numeral 38, 96, 98 in Figures 2 and 3) that fit into a standard package, an electrical component (reference numeral 70, 71 in Figure 2) confined within said package on a printed circuit board to allow hot-plugging into said cage, and a fixed pin-type electric connector (reference numeral 100 in Figure 3) to allow said fiber optic module to be soldered onto a host printed circuit board (reference numeral 24 in Figure 1). Yingst differs from the claimed invention in that Yingst fails to specifically teach four channels or four optical receptacles complying with a standard SC duplex Gigabit Interface Card package for receiving said fiber optic modules or a module cage complying with a standard SC duplex Gigabit Interface Card (GBIC) package. However, SC duplex Gigabit Interface Card package configurations are well known in the art and standard in the art of optical communication. One skilled in the art would have been motivated to design the module of Yingst to comply with SC duplex Gigabit Interface Card standard in order to allow the module to communicate with a network. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to design the module of Yingst to comply with SC duplex Gigabit Interface Card standard. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use four fiber optical receptacles/channels, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co., 193 USPQ 8.*

Regarding claim 32, 33, 35, and 36, Yingst differs from the claimed invention in that Yingst fails to specifically teach the use of LC, MT, or RJ connectors. However, LC, MT, and RJ connector types are very well known in the art and readily available. One skilled in the art would have been motivated to use LC, MT, or RJ connectors in order to make the system compatible with many of the communication system in use today. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to use LC, MT, or RJ connectors in the system of Yingst.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Daly teaches relevant art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (703)308-1393. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703)305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

AB

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